DSL MODEM

for FC9660RA12



Issue 2 Rev. 2, February 2000

Installation Guide

FJTU-320-600-900

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Issue 2, Rev 2, February 2000
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Safety Information

Safety Warnings

Potentially hazardous voltages exist within this unit. Always observe standard safety precautions and also the safety warnings in this guide during installation, operation, and maintenance of this product. There are no user provisionable options.

FCC Warning

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

UL Installation Safety Instructions

This device is UL listed. Follow these instructions.

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in a wet location unless the jack is specifically designed for wet locations.
- Never touch the telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.

Table of Contents

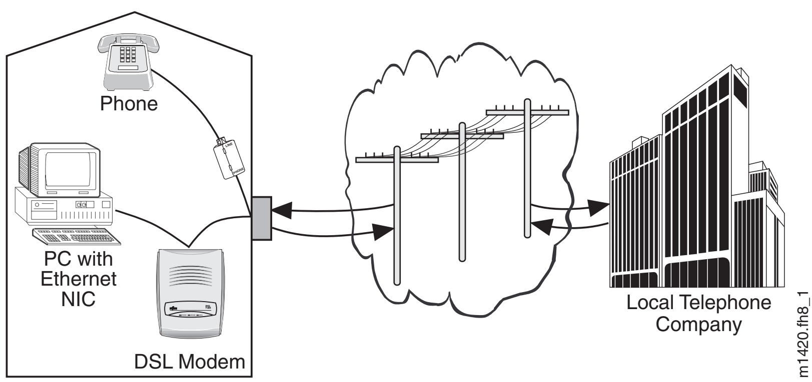
Page

1 Introduction

Congratulations on your purchase of a Digital Subscriber Line (DSL) modem. The DSL modem is part of a system that provides an integrated end-to-end solution for data connectivity, multimedia services, and high-speed Internet access services using asymmetrical digital subscriber line (ADSL) transmission over your current telephone wiring. With ADSL technology, information can be processed at speeds up to 250 times faster than today's analog modems.

1.1 ADSL Technology

The ADSL technology uses advanced digital modulation to transmit at high speeds over standard telephone wiring. This technology can download data at speeds up to 8 megabits per second and upload data at speeds up to 768 kilobytes per second.



By using a DSL modem, Internet service providers and local telephone companies can offer high-speed Internet access, virtual private networks (VPNs), telecommuting, video on demand, and other broadband services.

There are two methods of installing the DSL modem service in the home. Both methods are explained in the following chapters. The first method, using microfilters, is explained in Chapter 3. The microfilter removes high-frequency noise from

your telephone sets and other telecommunication devices. The second method requires a splitter and is explained in Chapter 4. If it is determined that a splitter is required, it will be installed by your DSL service provider.

Whether microfilters or a splitter is installed, a DSL modem allows telephone conversation and data downloads simultaneously over the existing telephone line. The microfilters and splitter are completely passive. The telephone service will work, even in instances of power outage. The DSL modem encodes the data sent from the PC and sends it to a corresponding DSL modem located at the local service provider's office.

1.2 Unpacking Instructions

Before unpacking, make a preliminary inspection of the shipping box. Any evidence of damage should be noted and reported immediately to a customer support center.

> ***Note:*** *The customer support information can be found in the product information packet provided by your DSL service provider. Keep the shipping boxes and packing material for return.*

It is recommended that you unpack the equipment on a clean, flat surface.

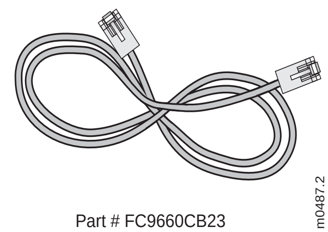
1. Place the shipping box upright. Cut the sealing tape and then open the flaps.
2. Take out the items in the box. Inspect the product for damage and verify that all parts are included.
3. Report any damage or missing parts to the customer support center.

1.3 DSL Modem Package Contents

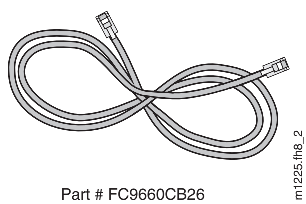
The DSL Modem package contains:



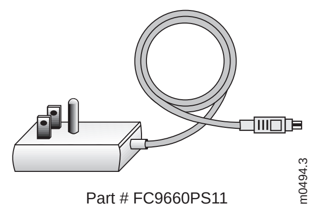
DSL Modem



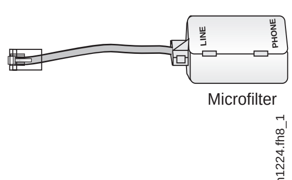
RJ-45 Ethernet Crossover Cable



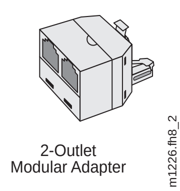
RJ-11 to RJ-11 Line Cord



Power Supply Convertor



Microfilter (splitterless application)



Two-Outlet Modular Adapter (splitterless operation)

Figure 1-1: DSL Modem Package Contents

2 DSL Modem Description

2.1 DSL Front Panel

Figure 2-1 depicts the DSL modem LEDs.

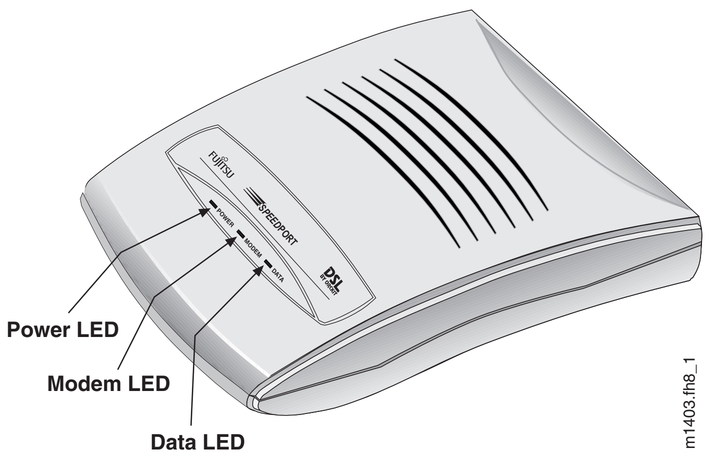


Figure 2-1: DSL Modem LEDs

The following table describes the LEDs on the DSL modem.

Modem Lights On	Description
POWER	Indicates power is applied to the modem
MODEM	Indicates a link with the phone company equipment
DATA	Indicates the ADSL data rate is operating

2.2 DSL Rear Panel

Figure 2-2 depicts the rear connections of the DSL modem.

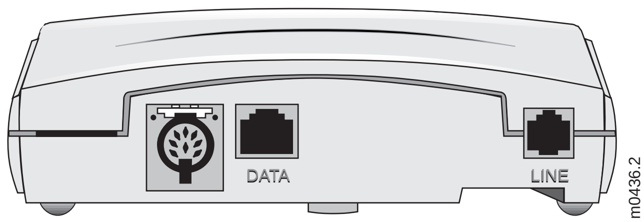


Figure 2-2: DSL Rear Panel Connections

The following table lists and describes the functions of the items located on the rear of the modem.

Connector	Description
POWER	Multipin connection for the power supply wall transformer cable
DATA	RJ-45 connection for the Ethernet cable (crossover)
LINE	RJ-11 cable connection to the wall plate

2.3 DSL Bottom Panel

The DSL modem can be installed on a desktop, shelf, or mounted on a wall. Wall mounting requires two wall anchors (not included). The holes located on the bottom of the modem are used to hang the unit on the wall anchors.

Figure 2-3 shows the bottom of the DSL modem.

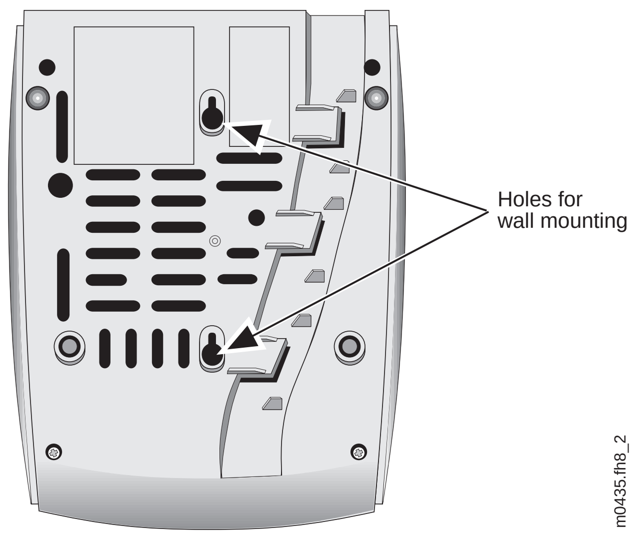


Figure 2-3: DSL Bottom Panel of Modem

3 Installing the Splitterless DSL Modem

3.1 Overview

The procedures in this chapter apply to those customers who install their own microfilter-to-phone connections. If a DSL technician is performing the wiring, proceed to Section 5, Powering the Modem.

Note: *Do not install a microfilter on the DSL modem line.*

The splitterless installation requires the placement of a microfilter on every telephone set, answering machine, or telephone device (i.e., analog modem) in your home. However, several phones and, or telephone devices may share the same microfilter. Microfilters and modular adapters are included with your modem package.

CAUTION:

Using more than five microfilters is not recommended and can impact the quality of your telephone service.

Note: *The following installation procedure and figures represent a possible home scheme. Not all homes will follow this convention. It is recommended that any DSL inside wiring be performed by a DSL technician.*

3.2 Microfilter Installation Procedures

Installing microfilters should not require any new inside wiring. Existing wired RJ-11 telephone jacks are all that is required to complete this installation. See Figure 3-1 for an installation diagram.

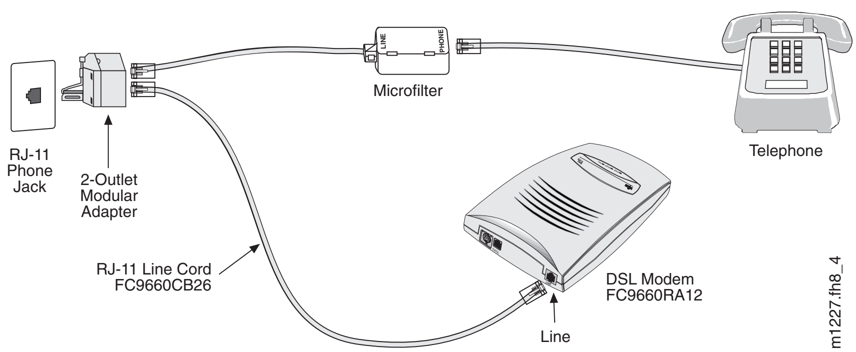


Figure 3-1: Typical Splitterless Installation

1. Start in the location where you want to install your DSL modem. Look for the existing phone outlet (RJ-11 faceplate), and remove the existing RJ-11 cord from the wall.
2. Connect the provided two-outlet modular adapter device into the RJ-11 telephone jack.
3. Connect the provided DSL modem RJ-11 line cord, part number FC9660CB26, into one side of the two-outlet modular adapter.
4. Connect the other end into the RJ-11 LINE slot, located on the back of DSL modem.
5. Connect one of the provided microfilters into the remaining empty two-outlet modular adapter slot.

6. Connect the telephone RJ-11 cord connector into the microfilter RJ-11 PHONE slot.
7. Connect all remaining telephone devices to a microfilter. See Figure 3-2, 3-3, 3-4 for examples.

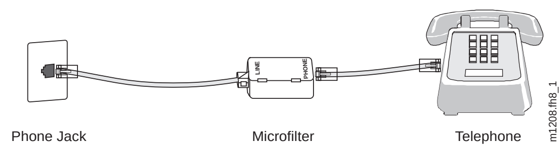


Figure 3-2: Telephone Set Application

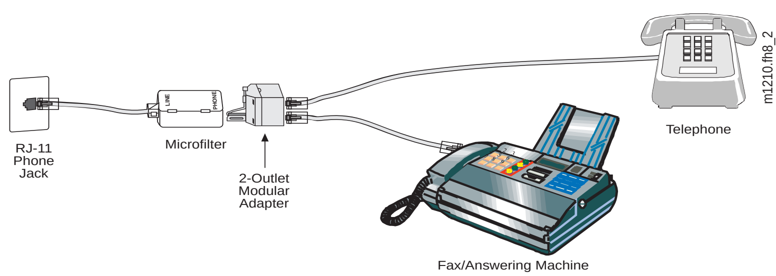


Figure 3-3: Answering Machine Application

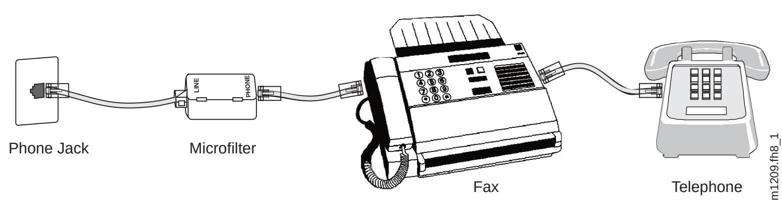


Figure 3-4: Fax Application

8. For an Ethernet connection, connect one end of the Ethernet (crossover) cable, part number FC9660CB23, to the RJ-45 slot titled DATA on the back of the DSL modem and connect the other end of the Ethernet cable to the network interface card in back of the computer. See Figure 3-5 for examples.

Note: *The term “straight,” when used to describe the cable assemblies, is defined to mean that the transmit and receive pin-outs remain the same entering and exiting the cable assembly. The term “crossover” means that the transmit and receive pin-out pair will be reversed or crossed over in the cable assemblies*

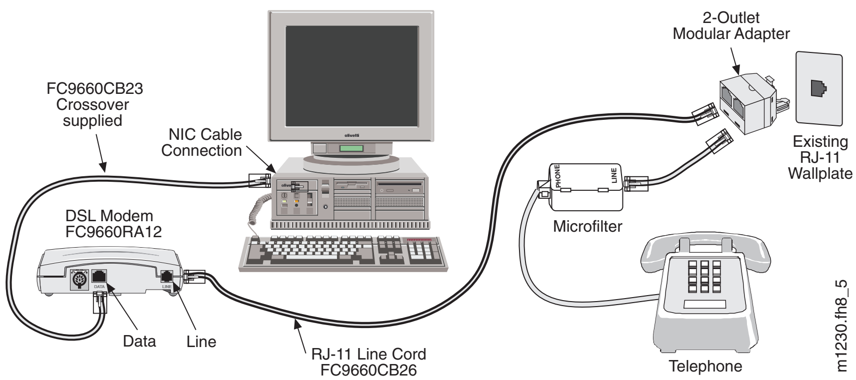


Figure 3-5: Ethernet Cable Connection

3.3 Connecting Multiple PCs to an Ethernet Local Area Network (LAN) using the Splitterless Application

***Note:** Connecting multiple PCs to the internet via a single DSL modem may require multiple IP addresses. Call your local ISP provider for details.*

Figure 3-6 is an example of a residential, small office/home office, or small business customer using ADSL to achieve high-speed access to the Internet. The DATA Ethernet connection can interface a multiport Ethernet hub. The hub allows multiple PCs to share bandwidth to and from the DSL modem. See section 3-2 for the microfilter installation procedure.

***Note:** The maximum distance for an Ethernet connection, using category 3 or category 5 cable is 100 meters (325 feet).*

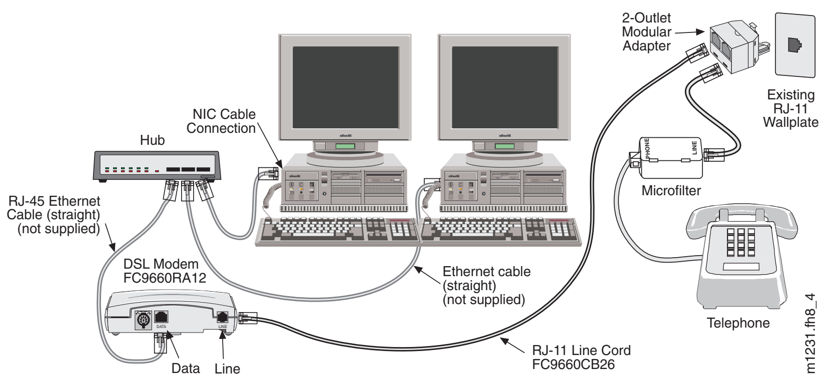


Figure 3-6: Multi-User Ethernet Internet Access

***Note:** Ethernet Hub and straight cables are not provided.*

4 Installing the DSL Modem with Splitter

4.1 Connecting the Inside Wire and Modem Cables

CAUTION:

Improper inside wiring can cause ADSL service interruption. Interior home wire is the homeowner's responsibility. Figure 4-1 represents a standard wiring scheme. Not all homes will follow this convention. Standard telephone company inside wire coverage options will not cover the cost to repair voice path problems that result from homeowner wiring attempts. These repairs may be billed to the homeowner as regular time and materials repair charges. It is recommended that all ADSL inside wiring be performed by a DSL service technician.

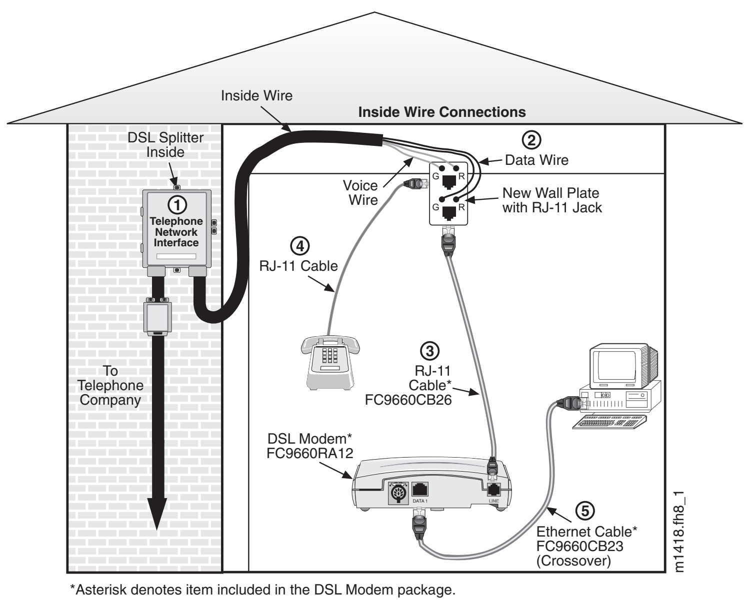


Figure 4-1: Connecting Inside Wire and Modem Cables

Figure 4-2 shows an expanded view of the inside wiring of the telephone network interface box.

1. On the outside of your house, locate and open the telephone network interface box. (Your local DSL service provider should have installed the DSL splitter) Slide open the splitter latch door and locate the colored screws. (Note the color of the wires that are connected to the green and red screws.) See Figure 4-2 for an illustration.

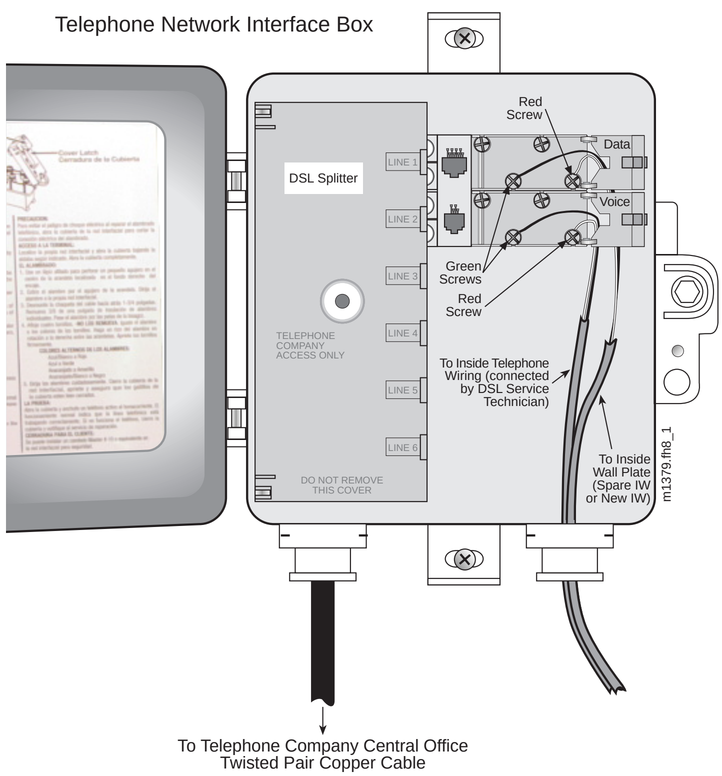


Figure 4-2: Telephone Network Interface Box- DSL Splitter

2. Inside the residence, locate the telephone RJ-11 wall jack that is nearest to your PC and remove it. Replace it with a new dual RJ-11 wall plate and connect the same colored wires that are attached to the green and red screws on the DSL splitter data module to the green and red pins on the RJ-11 wall jack. For example, if a black wire is connected to the green screw in the data side of the DSL splitter (see Figure 4-2), connect the same black wire to the green pin of the new wall jack. (If required, repeat this step for the voice wire.)

3. Connect the new RJ-11 cable, part number FC9660CB26, by inserting the RJ-11 connector into the RJ-11 data jack on the wall plate and the other end to the LINE connector on the back of the DSL modem.

4. Connect your telephone set to the other telephone RJ-11 voice jack on the wall plate.

5. For an Ethernet connection, connect one end of the Ethernet (crossover) cable, part number FC9660CB23, to the DATA connector on the back of the DSL modem and connect the other end of the Ethernet cable to the network interface card in the computer.

   Note: *The term “straight,” when used to describe the cable assemblies, is defined to mean that the transmit and receive pin-outs remain the same entering and exiting the cable assembly. The term “crossover” means that the transmit and receive pin-out pair will be reversed or crossed over in the cable assembly.*

4.2 Connecting Multiple PCs to an Ethernet Local Area Network (LAN) using the Splitter Application

Note: *Connecting multiple PCs to the Internet via a single DSL modem may require multiple IP addresses. Call your ISP provider for details.*

Figure 4-3 is an example of a residential, small office/home office, or small business customer using ADSL to achieve high-speed access to the Internet using multiple PCs. The DATA connection can interface a multiport Ethernet hub. The hub allows multiple PCs to share bandwidth to and from the DSL modem. See Section 4-1 for the procedure to connect inside wire and modem cables.

Note: *The maximum distance for an Ethernet connection, using category 3 or category 5 cable, is 100 meters (325 feet). .*

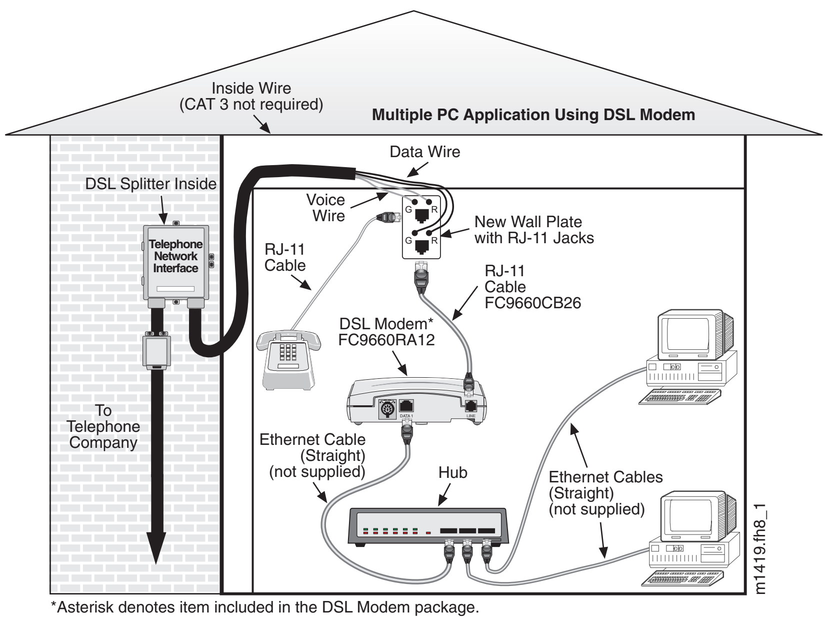


Figure 4-3: Multi-User Speedport Internet Access

Note: *Ethernet hub and straight cables are not provided.*

5 Powering the Modem

WARNING:

When installing the DSL modem power supply unit, be sure to first insert the power supply connector into the rear of the DSL modem before plugging the unit into a powered 110V AC wall outlet.

To apply power to the DSL modem, perform the following steps:

1. Insert the power cable (DC connector) into the rear of the DSL modem.
2. Plug the other end (AC male plug) of the power supply cable into a 110V AC wall outlet.

Once the modem has power, it performs several self-tests. The POWER, MODEM, and DATA LED lights will be in a steady state.

When the POWER light is in a steady state and the MODEM light blinks, a link is being established.

The modem is operating at full capacity when the POWER, MODEM, and DATA lights remain in a steady state.

Note: *Figure 5-1 is a DSL modem Turn-up Flow Chart. If the POWER light is blinking, a failure has been detected during the self-test. Contact the customer support center.*

This completes the DSL modem installation and turn-up procedure. If modem problems exist after reading and following this procedure, please contact the customer support center.

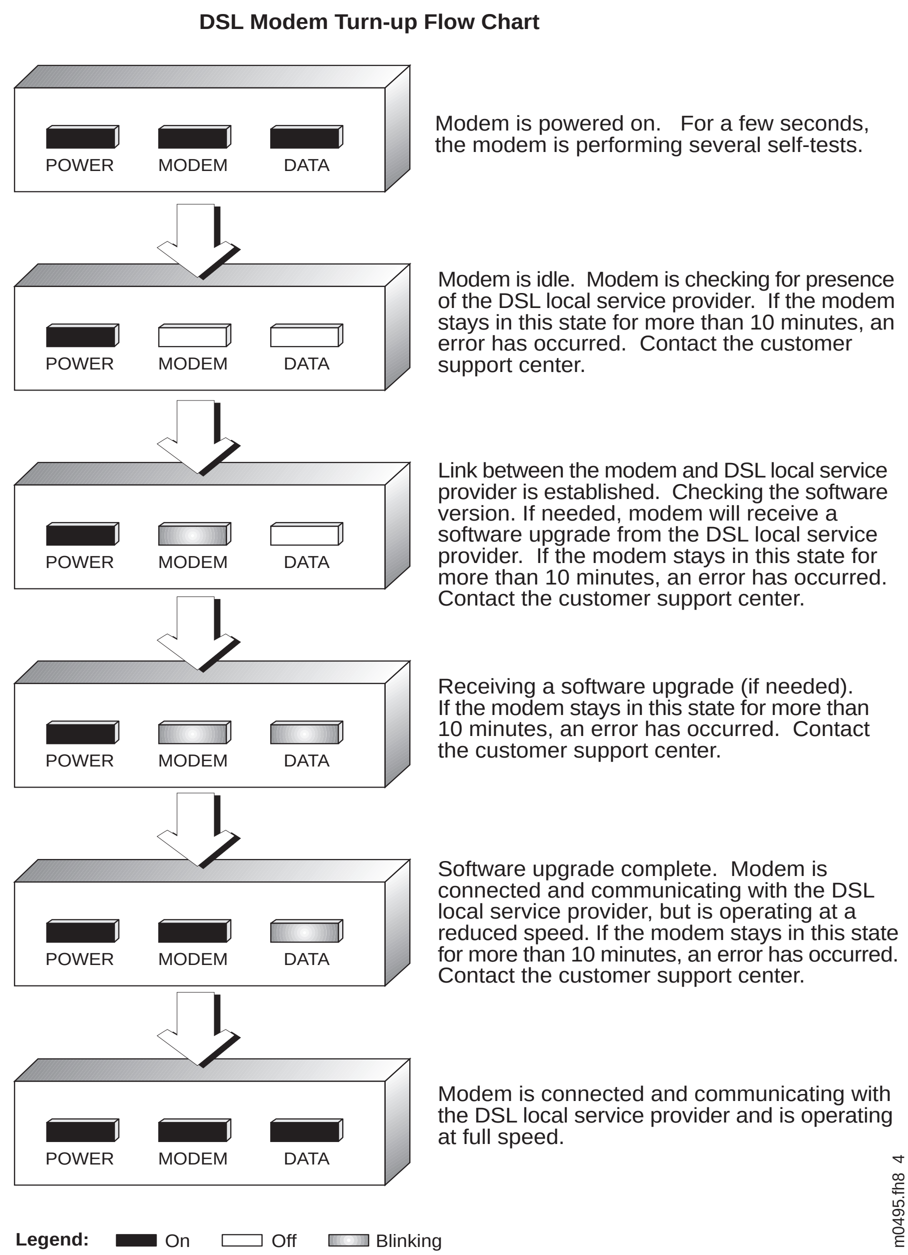


Figure 5-1: Turn-Up Flow Chart